not, of course, be large, but their value viewed from the scientific point of view will be all out of proportion to their size.

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SAND-STORM ELECTRICITY

THE discussions on atmospheric electricity in SCIENCE[1] called to mind an electrical display which accompanied a sand-storm which I witnessed in 1902.

I was on the White Mountain Apache reservation, in Arizona, on the day in question, when an ordinary desert whirlwind whirled into view from just around a southerly projecting point of land north of White River from the now abandoned Fort Apache. I had just crossed a flat area among the hills where an ancient lava flow once spread out, forming a "lava lake," an area probably six miles across from the afore-mentioned point to the mountainous hills to the northwestward, up which I was then ascending. In a moment it began to gain momentum on entering the level country and in a minute more it was a roaring funnel that was hurling immense quantities of dirt and sand skyward so that they formed an umbrella-like cloud around the apex of the whirling center.

As the twister was coming directly in my direction, I shifted southward over a gulch to another ridge to escape its fury. On it came. It entered the canyon in which I had been only a minute before. Here as the canyon both wedged-in and ascended toward the mountains in the direction it was going, the rushing whirl became "angry," as it were. The day had been perfectly clear. Yet in a moment there were chain lightning and ripping thunder on every side, while at the same time the whirler uprooted trees and tore large-sized boulders from their places on the canyon walls, finally destroying itself in that canyon.

From my observations I am inclined to believe that the electrical display that accompanied this whirl was due to the friction caused by the whirling débris.

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"SOUR SAP" IN TREES OF THE GENUS PRUNUS

ANNUALLY there occurs in stone fruits in the deciduous-fruit-growing sections of California a considerable loss of trees from a disease which is locally known as "sour sap." In certain seasons sporadic epidemics of this trouble occur when thousands of trees, usually from about three to ten or twelve years of age, die suddenly in an unaccountable manner and with no previous warning. The disease is primarily one of winter or early spring. Trees which appeared to be in perfect condition at the end of the season either fail entirely to start the following spring, lose one or more of the main limbs or linger along into the summer only to die before the end of the season. Various climatic combinations have in the past been held responsible for sour sap, although it has never been definitely known at just what time of the winter the initial injury actually develops. The name refers to a condition of the bark or cortex region of affected trees which is attended by decided souring and death of this portion of the host. The disease has been known for many years, and although many attempts have been made to discover the cause or causes of this mysterious trouble, only of late has its true nature been understood.

We have found that there are two distinct souring diseases of trees of the genus Prunus, one caused by bacteria and one due to the presence of stagnant soil water which affects the roots during the early growing period of the host.

The disease caused by bacteria is the more common of the two and is entirely distinct from the other. The bacterial organisms usually attack the host through wounds, such as pruning or grafting cuts, during the winter months and cause a progressive disease of the cortical bark region, usually in the trunk above the bud union or in the main crotches but sometimes killing only certain limbs or one side of the tree. The roots are rarely affected, in fact, an infection in the trunk usually stops its extension abruptly at the surface of the ground and the tree then sends up a mass of suckers from the root. The parenchymatous tissues, including the cambium, are invaded, producing a highly discolored, plasmolyzed appearance with a water-soaked, very sour advance, in which bacteria can be seen in the cells and in the intercellular spaces. The bacteria are usually present in zoogloeal masses but at times are quite free and motile. Extensive epidemics of this disease occur only in occasional seasons at irregular intervals, and it seems certain that some correlation must exist between certain seasonal climatic or soil moisture conditions and the development of sour sap. While many theories have existed in regard to this correlation we have really no definite information at all as to the nature of these conditions or even as to the specific time when they occur.

Our work covers a period of seven years of field observations and three years of inoculation experiments on a wide range of Prunus species and varieties, including peach, cherry, wild and cultivated plums, apricot and almond, with the result that the

[1] March 30, 1928; May 3, 1929; October 18, 1929, and January 24, 1930.

typical condition has been reproduced in all the above hosts. No one bacterial species is constantly associated with the trouble, and up to the present time we have isolated six types, each of which has caused extensive lesions in susceptible hosts when inoculated from pure cultures. Only during the months of December, January and February has this condition been induced experimentally; before and after this period small lesions develop but rarely damage the trees to any extent.

The souring of trees caused by stagnant soil water is prominent at times during the spring when the trees are starting into leaf. Trees standing in water which is moving through the soil are not damaged, but those subjected to stagnant water suffer in proportion to the damage to the roots. The leaves turn yellow, wilt as though lacking moisture, become brown at the edges and finally die. The affected roots become highly discolored and sour and die, while those not injured remain normal and continue to support the corresponding upper portion of the trees. In these cases a portion of the affected tree remains alive and continues growth. There are all gradations of top effect, and many cases recover if the water is drained off.

Many trees affected with sour sap of either of the above types become also infected with bacterial gummosis, which further complicates the question of the primary etiology of the trouble.

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SILVER OR GOLD

As a rule silver tarnishes to a greasy black color. I have found silver articles in the Near East which fail to blacken on weathering, but instead, become coated with a film of golden hue. One would think that the silver had been gold-plated. I investigated this interesting fact and discovered that silver originating in Caucasian deposits was particularly capable of this type of tarnishing. Apparently the small platinum content or the presence of some of the similar rare metals is responsible for this phenomenon.

Antique dress jackets of the Near Easterners, made of beautiful purple velvet and decorated with what seems to be gold braid, are to be found in the bazaars. This gold braid is silver—there is no trace of gold in it. Silver braid was used and in the course of time it tarnished to the gold color. Slightly rubbing it with a jeweler's touchstone reveals the silver beneath the outer film.

Two pieces of old Russian silverware, formerly used by the late czar of Russia, were presented to me. These were highly polished when given me. They are now beginning to exhibit this characteristic tarnish.

Some silver "Alexander the Great" coins which I unearthed in Macedonia fail to show this tarnish. The origin of the silver of these coins is probably Macedonia. Although silver is not found in Macedonia now, we do know that the early Greeks did find it along the banks of the Exidoros.

Perhaps all that glittered on the royal purple robes was not gold but silver!

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REPORTS

THE AMERICAN MUSEUM OF NATURAL HISTORY

DEFINITE plans to seek, through gifts from the public, $10,000,000 added endowment for the scientific and educational work of the American Museum of Natural History were adopted on May 5 by the trustees at their sixty-first annual spring meeting. The board confirmed selection of a committee, with President Henry Fairfield Osborn as chairman, to present actively during the balance of the year in the metropolitan area and throughout the country the needs of the institution.

This action followed submission of the annual report of the museum by President Osborn, who emphasized that mounting costs since the war and increasing demands for expansion of the museum's functions had brought about a severe financial stringency. Many important activities, he stated, were at a standstill or below normal, while projects necessary to keep the museum in its position of leadership in science and public usefulness were in abeyance.

"We are held back internally, while outwardly we are prospering," said President Osborn. "Annual public support of the museum, though increased, continues to fall far short of even the routine needs. Only the heavy emergency contributions by trustees have prevented the discharge of a large number of employees, but the budget thus temporarily balanced covers little more than ordinary maintenance for 1930. It holds no guarantee for succeeding years, and it has not prevented a sharp curtailment of the scientific work which is the very being of the museum and the basis not only of its prestige but of its unique service to the city, the state, the nation and the world at large.

"If the museum, which has become the particular pride of the people of metropolitan New York and virtually a household word all over the globe, is to continue its brilliant record of achievement, thus far